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REMARKS

Independent claims 1 and 5 have each been further amended to more clearly claim the subject matter that the applicant regards as his invention. The claim amendments are intended to make clear that the invention is directed to the wireless digital transmission of digital data between a transmitting computer and a receiving computer. Each step of the process, including the wireless transmission, involves the conveyance digitally, from one computer to another computer, of information that is in digital form, without the need to modulate and demodulate a transmission signal. An important advantage of the invention is that information can be more quickly transmitted, of the order of megabits per second, than if it were in analog form, in which the data transmission rates are of the order of kilobits per second. As noted in the specification, the digital transmission system (DAB) involves three channels, a main service channel, a fast information channel, and a synchronization channel. However, computers are not configured to receive a more or less continuous DAB data stream, but operate in bursts, and the present invention enables higher speed data transmissions between computers by utilizing the DAB system.

Claims 1, 2, 5, and 6 were again rejected as obvious based upon the Nelson et al. and Matsuyama et al. references. In that regard, it should at first be noted that the present invention is directed to the digital transmission of digital data over the air between computers. The method and apparatus of the present invention are such that the transmission of digital data between

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computers is effected substantially continuously and in digital form, without transformation of data signals to or from analog form either before, during, or after the transmission. The speed limitation on the transmission of data between computers, by virtue of their burst mode of data transfer, is therefore overcome.

In the present invention, the digital information that is to be transmitted between computers is transmitted intermittently in digital form from a transmitting computer. Before its over-the-air transmission to a second computer the digital information is intermediately stored in a first memory of a first adaptation circuit. The information is then substantially continuously digitally transmitted over the air from the first adaptation circuit memory by a digital transmitter that substantially continuously wirelessly transmits the digital data to a digital receiver. The received digital data are stored in a second memory associated with a second adaptation circuit, and they are thereafter transmitted intermittently to the receiving computer. Thus, the adaptation circuits with their respective memories, together with the digital transmitter and digital receiver, enable the transmission of digital data between two computers in digital form and at a very high speed.

Claims 1 and 5 have each been amended to more clearly recite that the digital data are transmitted over a digital audio broadcast system. As claimed in new claims 9 and 10, the information is digitally transmitted from the digital transmitter to the digital receiver via a coded orthogonal frequency division multiplex transmission system.

As noted in paragraphs 5 and 6 of the present specification, the

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claimed digital audio broadcast system (DAB system) as recited in the claims allows faster transmission of larger amounts of data between computers than can be obtained by more conventional transmission methods and systems. In a DAB transmission system the entire bit stream in the DAB signal is transmitted in frames that have a typical duration of 96 milliseconds. Each frame combines data from three channels, namely the main service channel MSC, the fast information channel FIC, and the synchronization channel. Thus, in accordance with the DAB system the digital data are transmitted in a special way wherein the data stream is substantially continuous. It is that continuous nature of the transmission that gives rise to the problem to which the present invention is directed – that a computer cannot transmit or receive a continuous data stream, only bursts of data, which makes it impossible to rapidly transfer data from one computer to another by way of a DAB transmission. In accordance with the present invention, such a system for use between computers makes use of adaptation circuits that allow wireless transmissions of data to occur substantially continuously, while each of the computers continue to operate in the burst mode.

With regard to how the transmission occurs, reference is made to U.S. Patent No. 5,949,796, in which the following is presented:

The digital signal generated by the DAB transmitter exists together with the conventional analog frequency-modulation (FM) signal in the commercial broadcast FM-band (87.9 MHz to 107.9 MHz in the United States) and is typically emitted from the same antenna system. The analog FM signal and the digital signal are unrelated and are received independently. The digital signal is generated to occupy the upper and lower sideband frequency regions which surround the analog FM signal. The spectrum of the digital signal is substantially contained within the predetermined RF emission mask. Redundant data is transmitted in both sidebands

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simultaneously or with diversity delay so that the loss (i.e. unreliable determination) of the source information in only one of the two sidebands due to multipath or adjacent station interference does not substantially disrupt continuous reception of the digital signal.

'796 patent, col. 1, lines 8 through 24.

The RF signal for DAB represents digital (bit) information which is encoded in the signal generated in the transmitter system by a modulation method. Unlike conventional analog FM modulation, the information represented by the digital signal (e.g. digitized speech, music, and/or data) is typically unrelated to the characteristics of the transmitted RF signal. A primary goal of DAB is to eventually supplant the existing commercial analog radio broadcast network (i.e. AM-band and FM-bands).

'796 patent, col. 1, lines 60 through 66.

Thus the DAB system operates differently from conventional FM, and it is conventional FM utilizing modems which is what the Nelson et al. reference teaches. In the DAB system the digital databits are packaged in a special way, which gives rise to very high transmission rates, in Mb/sec.

The Nelson et al. reference that was cited and relied upon discloses a different system and a different method that involve the transmission of data between data terminals over the air in analog form. Nelson et al. provides sending and receiving modems 10 (see Nelson et al., Figure 1) that modulate the transmitted and received signals to transform the signals to and from analog form. The transmission is by way of conventional two-way FM radios (see Nelson et al, col. 1, lines 10 and 25; and col. 3, lines 5 and 20).

In the Nelson et al. arrangement, the data from the first data terminal are modulated in a modem into an analog output signal (see Nelson et al., Figure 2, which identifies that output as "analog output"). That analog output signal is then broadcast as a modulated signal by a conventional FM radio

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transmitter 16 to a conventional FM receiving radio (see Nelson et al., col. 2, lines 12 through 15). The received analog signal (see Nelson et al., Figure 3, which identified the input as "analog input") is demodulated for delivery to a receiving data terminal. Thus, Nelson et al. is not directed to the problem to which the present invention is directed, which is the high-speed digital transmission of digital data. Therefore, one having only ordinary skill in the art and seeking to solve the problem to which the present invention is directed would not be led to the Nelson et al. reference because it is not pertinent to the enablement of the desired rapid digital transmission of digital information. Consequently, the present invention is different from and is a clear distinction over and an improvement upon the Nelson et al. system.

The examiner concluded that, "Nelson teaches transmission of digital information over the transmission path." In fact, however, Nelson et al. does not disclose or even remotely suggest any digital method of transmission, only an analog method of transmission. Based upon the text of the Nelson et al. reference, Nelson et al. clearly does not disclose either a method or an apparatus for digitally transmitting information from one computer, working burst-wise and by way of a normal data bus, to another computer, also working burst-wise by way of a normal data bus, by the use of a digital audio broadcast system.

Nelson et al. uses only normal two-way FM-radios 16 for the transmission and reception of data in analog form. The Nelson arrangement does not transmit digital data through the air; instead, it converts the digital data to a modulated signal for the radio net and then converts the modulated signal to

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digital data. Thus, the present problem, namely to be able to use the DAB-system with a substantially continuous data stream together with computers at both ends of the transmission path, and that operate burst-wise, is not even alluded to in the Nelson et al. reference. In contrast with a conventional transmission system, the information transmission capacity of a DAB-system is very high. Therefore, it is extremely advantageous to use a DAB-based system to more quickly broadcast large data files to even several computers simultaneously.

It should be noted that a normal computer at the transmitting end of a communication link, working burst-wise, cannot control a DAB-transmitter because of the burst-wise delivery of data. Additionally, a normal computer at the receiving end of a communication link cannot receive a DAB signal because of the fact that the receiving computer can only receive data burst-wise. That limitation exists regardless of the fact that the data being transmitted are digital data. As noted earlier, the DAB-system operates to digitally transmit substantially continuous digital data streams, while the computer containing the data to be transmitted and the computer that is to receive the transmitted data do not deliver or receive data on a substantially continuous basis.

To accommodate the data delivery and reception modes of operation of computers, the present invention includes an adaptation circuit on the transmitting side and an adaptation circuit on the receiving side. The adaptation circuits convert the data stream from intermittent to substantially continuous on the delivery side of the system, and convert the substantially

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continuous data stream to intermittent on the receiving side of the system. It is important to note that the claimed adaptation circuits and their methods of operation are neither disclosed nor even remotely suggested in the Nelson et al. reference. The reason Nelson et al. does not even mention such circuits is simply because such circuits are not needed for analog-based, FM-transmissions of data.

The two adaptation circuits each have a respective oscillator, which each operate at substantially the same frequency. The adaptation circuits also include respective memories. The Nelson et al. buffers do not have the same functionality as the memories in the claimed invention.

On page 3 of the office action the examiner acknowledged that the Nelson et al. reference does not teach "said digital transmitter and receiver operate to transmit and receive information over a digital audio broadcast system"; that it does not teach communication between a computer and "at least one other computer"; and that it does not teach "an outfeed oscillator" and "an infeed oscillator" and "operating the two oscillators at substantially the same frequency", as was claimed herein. By that admission, it is clear that the Nelson et al. reference does not disclose the important features of the claimed invention. Accordingly, it would not be obvious to modify the Nelson et al. disclosure to arrive at the claimed invention. Nor is there any motivation apparent to lead one from the reference disclosure to the claimed invention. Although the examiner has concluded that "these claimed subject matter would have been apparent to a person of ordinary skilled in the art," no references were cited to show how and

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why the claimed invention would be obvious. Indeed, in the DAB system the digital data are transmitted in a special way wherein the data stream is more or less continuous. It is that continuous transmission characteristic that gives rise to the problem to which the present invention is directed – that a computer cannot give or receive a continuous data stream, but only bursts of data. The present invention solves that problem.

In the Nelson et al. arrangement the data stream is sent burst-wise and at a rate of kilobits per second. That arrangement does not transmit digital data wirelessly, but, instead, converts the digital data signal to a modulated analog signal for transmission over the FM radio network and then converts the received modulated analog signal to a digital data signal. If the Nelson et al. arrangement were to be attempted to be utilized with a DAB system, the problem described above would arise in connection with computer-to-computer data transmission wirelessly. Thus, the Nelson-DAB system creates the problem instead of solving the problem.

Additionally, the Nelson et al. reference discloses an arrangement containing a phase locked loop for signal synchronization. The Matsuyama et al. reference was cited for its disclosure of an oscillator in a clock signal regenerating circuit. But the mere mention in a reference of an oscillator in a clock signal circuit still does not address the problem that is solved by the present invention. Accordingly, one having only ordinary skill in the art would not be led to the Matsuyama et al. reference in connection with a solution to the problem solved by the present invention.

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Furthermore, regarding oscillators, the examiner acknowledges that Nelson et al. does not teach the use of oscillators. However, the oscillators are essential in order to carry out the present invention in accordance with the DAB-standard, as discussed in the present application, page 6, lines 1 through 28. Because Nelson et al. does not disclose such oscillators, Nelson et al. cannot use a DAB-system - what Nelson et al. uses instead is normal analog FM-radio system.

Moreover, there is no suggestion in either the Nelson et al. reference or the Matsuyama et al. reference that would lead one having only ordinary skill in the art to attempt to combine their teachings. And even if their teachings were to be combined, the combination still does not teach the substantially continuous digital transmission at high speed of digital data between computers without modulation of the signals into and out of analog form. Therefore the present invention is neither taught nor suggested by either of the Nelson et al. or Matsuyama et al. references, nor is it taught or suggested by their combination.

Claims 2 and 6 depend from claims 1 and 5, respectively, and therefore the same distinctions as are noted above relative to claims 1 and 5 also apply to those dependent claims, whether the references are considered alone or together.

Claims 3, 4, 7, and 8 were rejected as obvious in view of the disclosures contained in the Nelson et al. and Matsuyama et al. references, along with the disclosures contained in the Dingsor and Nomura et al.

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references. In that regard, the primary Nelson et al. reference and the secondary Matsuyama et al. reference have already been distinguished from the claimed invention. With regard to Dingsor, that reference is directed to a device in an FM radio receiver, and it clearly contemplates the over-the-air transmission of analog signals, as does the Nelson et al. reference, not the substantially continuous over-the-air digital transmission of digital signals, as claimed in the present application. And the Nomura et al. reference relates to a receiver for determining the transmission mode of a DAB transmission, but it does not teach or suggest the transmission of digital information between two computers. It, either alone or together with the other references relied upon, therefore does not enable one to solve the problem to which the present invention is directed.

In addition to the references individually not showing or suggesting the invention as it is claimed, even if those references were to be combined in some way, the combination does not suggest the claimed invention. Moreover, the references do not contain any hint as to exactly how they could be combined to arrive at the invention as claimed. In that regard, it is not apparent which features of which reference are to be combined with which features of the other reference. In short, the references do not contain any suggestions concerning how they could be combined. Accordingly, it is suggested that the only motivation for combining the references in the manner the examiner has done is the disclosure of the present application. And to use as a road map or as a template an inventor's disclosure to aid in picking and choosing particular parts of references that allegedly can be combined to render obvious that which only the

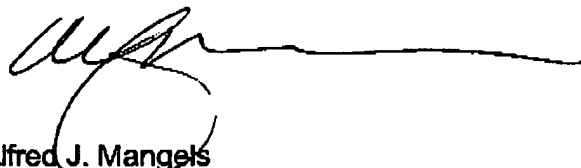
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inventor has taught is an improper basis for rejection. The invention as claimed is directed to an invention that is not obvious from the teachings of the references relied upon.

Based upon the foregoing remarks, the claims as they now stand in the present application are believed clearly to be in allowable form in that they patentably distinguish over the disclosures contained in the references that were cited and relied upon by the examiner. The claimed invention is both structurally and functionally different from the disclosures contained in the references, and it also is not taught or suggested by the references, whether the references be considered individually or together. Consequently, reconsideration and reexamination of the application is respectfully requested with a view toward the issuance of an early Notice of Allowance.

The examiner is cordially invited to telephone the undersigned attorney if this amendment raises any questions, so that any such question can be quickly resolved in order that the present application can proceed toward allowance.

Respectfully submitted,



September 7, 2005

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